UNIVERSITY OF WASHINGTON

ARBORETUM BULLETIN

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President's Message

How often have you thought to yourself "What can I do to further the goals of the Arboretum and the Arboretum Foundation"? If you have these thoughts from time to time we suggest the answer to this question is to get involved in the various committees of the Foundation, or to volunteer for work and fun with the various programs of your Unit Council. In this connection I would like to introduce to the membership the Foundation Committee-heads for the ensuing business year.

Arboretum Unit Council . . . . . Mrs. Marge Clausing
Membership Committee . . . . . .Mr. L. James Brady
Education and Special Projects . . . . . Mr. John Putnam
Japanese Garden Committee . . . . . Mrs. Neil Haig
City Liaison Committee . . . . . Mr. Chris Johnson
Floral Hall Committee . . . . . .Mrs. Rosalie Milburn
Memorials Committee . . . . . Mrs. Alan B. Engle
Arboretum BULLETIN . . . . . Dean Gordon Marckworth
Book Committee . . . . . Mrs. Doris Butler

Many of these committees, particularly Membership, offer involvement opportunities and a chance to contribute to the Foundation. For further information call Marilyn Wolf at the Foundation office.

The Memorials Committee has had some recent meetings and we are hopeful that the long awaited "Emma Stimson Memorial Gate" at the South entrance to the upper Arboretum Drive will be approved and put out for bid. This could, conceivably, mean completion by the first of the year.

Robert J. Behnke
President

THE UNIVERSITY OF WASHINGTON

Arboretum bulletin

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COVER PHOTO: **Lepiota Naucina**
Photo by: Joy Spurr

Mushrooms of the Arboretum

Verpa bohemica — *Photo by Joy Spurr*

*BENJAMIN WOO**

While most of the people who visit the Arboretum come to admire its greenery and floral beauty, or to enjoy its open spaces, a small but growing number are there to look for mushrooms. Wet weather in the spring or fall (when strollers, joggers, lovers and fishermen are sensibly indoors) brings out the mushroom hunters. What accounts for this eccentric behavior in many otherwise normal citizens is what we propose to examine in this article.

Mushrooms are members of the fungi, which is a large group of organisms that are neither plants nor animals, but are commonly regarded as plants lacking chlorophyll. The larger number of fungi conduct their activities in ways that are inconspicuous to humans and are therefore not widely known. Mushrooms are fungi that produce relatively large and fleshy fruiting bodies, and because some are known to be edible and others to be dangerously if not deadly poisonous, are objects of curiosity to many people.

Fungi share a common structural simplicity. There are no roots, stems, leaves, flowers or seeds. There is basically only a vegetative portion called the *mycelium* and the fruiting body,

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*Mr. Benjamin Woo, a Seattle architect, was one of the Founders and first President of the Seattle Mycological Society. His continuing interest in and knowledge of mushrooms makes him well qualified to write on the subject.

one form of which is known as a mushroom. Fungi, lacking chlorophyll, do not have the ability to manufacture food, and therefore rely on organic remains of plants and animals for their livelihood. The mycelium, consisting of an extensive network of extremely fine filaments called hyphae which are composed of cylindrical cells connected end-to-end, permeates the growing medium which provides food material. The cells emit enzymes that convert organic material to nutrient solutions that are in turn absorbed by the cells. This process assists in the reduction of dead plant and animal material to basic components that can be re-used by plants. Fungi therefore constitute an important ecological factor.

Fungi reproduce by means of spores which are produced by the fruiting body. Of many types of the latter, the most familiar is the mushroom. Other forms are woody brackets found on dead trees, jelly-like globs found on twigs, coral-like growths on the ground, blue molds on bread and blisters or pimples on infected plants. Fruiting bodies are formed when the mycelium has achieved the necessary growth, and this is commonly attained during wet weather in spring or fall in our climate.

Fungi tend to specialize strongly in their choice of food material and habitat. Some grow strictly on decaying wood, others on the ground in forest duff, some preferring grasslands, others dunes or deserts, still others the bare ground resulting from slides or human activities, and some appear as a certain aftermath of forest fires. Certain mushrooms are found in the company of certain trees, and sometimes this association is so marked that the mushroom will be found nowhere else, and the tree will not thrive without the presence of the fungus.

The key to abundance of mushrooms is a reliable supply of food material and a constant habitat. In this respect, the Arboretum is less than an ideal home. There is continual disturbance due to movement of people, transplanting and cultivation, pruning and raking and removal of leaves and other debris that provide a decent living for a mushroom. Of course there are also pockets of affluence, windfalls of mulch and compost that transform a disadvantaged planting bed into a temporary feast for dormant fungus spores. Some of these composting activities produce exotic cultural conditions that bring forth exotic mushrooms. On the other hand, certain areas, such as parts of Foster's Island, are left relatively undisturbed for years, and have the opportunity to develop a characteristic mushroom flora. By and large, it can be said that the Arboretum is a poor place to look for quantities of edible mushrooms, but a good place to find interesting and unusual species.

In western Washington, mushrooms are found in the spring or in the fall, with a few species fruiting during both seasons. Thus, there is a spring flora and a fall flora. The Arboretum's spring season begins with a few cold-resistant species in late February, the most common being *Naematoloma fasciculare*, a bitter and inedible mushroom growing in yellowish clusters on dead stumps. *Coprinus micaceus*, in tightly-packed bunches of tan caps on dead wood, are edible when young, turning into gobs of black ink when mature, appearing in March. April brings *Verpa bohemica*, the bohemian morel, to the cottonwood groves on Foster's Island. They are sometimes abundant but so are the hunters. Some years, dead cottonwoods will bear clusters of stemless caps of a pale form of *Pleurotus ostreatus*, edible and good, but usually beyond reach on the standing trunks. Easier in April and May are scattered white puffballs, *Lycoperdon gemmatum*, in the lawns.

Warmer weather in May and June will bring *Marasmius oreades*, the edible fairy ring mushroom, in the grass, as well as the meadow mushroom, *Agaricus campestris*, white capped with pink gills turning to chocolate brown. These are tender and choice. Also in the grassy areas in the spring are slender brown *Psilocybes, Inocybes, Galerinas* and similar difficult-to-identify species that are to be avoided.

Sometimes there are surprises. In May of 1967, *Beletus edulis* variety edulis, was found growing in grass on Foster's Island. Some six or eight specimens were found during the course of a week in the vicinity. Since this is one of the best known and highly prized edible mushrooms, the Steinpilz of central Europe, we have looked for it every year since, with no luck. This mushroom grows under spruce along the coast in the fall, but its locale in the Arboretum

was near a couple of pines, a madrona, and few birches and assorted oaks.

Another example of the unusual mushroom flora of the Arboretum was the appearance some years ago of a large, red-brown capped mushroom in sawdust-mulched areas adjoining East Drive. Heavy bodied, with dark spores and a double annulus, it was identified as *Stropharia rugoso-annulatus* by Dr. Stuntz of the UW Botany Department, a species known from Europe and Japan. A number of people had picked and eaten it, thinking it to be a species of Agaricus. The fruiting recurred for three years, then abruptly ceased. None have been reported since.

The fall flora in the Arboretum includes many species common to the area together with a few that occur nowhere else. A renewed fruiting of some spring species will occur with the first rains. These include *Agaricus campestris, Marasmius oreades* and puffballs in the lawns, joined by *Psilocybes, Galerina, Inocybes,* small *Stropharias, Panaeoli* and other small dangerous species. *Clitocybe sudorifica*, often mistaken for young meadow mushrooms by less observant collectors, teaches an unpleasant lesson in toxicity.

Mushrooms associated with trees are easier to locate and more reliably identified. Birches can be counted upon to furnish *Paxillus involutus* (marginally edible) in quantity, *Lactarius necator* (unattractive and inedible), *Leccinum scaber* (excellent but unfortunately heavily sought), and *Lactarius glyciosmus* (small and edibility not known). Pines are accompanied by various boletes (all edible but avoid those with red pores)—*Suillus lakei, S. granulatus, S. grevillei* are common, but not reliably in any particular location. Firs are associated with *Agaricus placomyces* or *A. meleagris*, handsome but suspect.

Lucky hunters will be rewarded with finds of *Lepiota rhacodes* or *L. naucina*, or occasionally a prize of *Agaricus augustus*. But, in all likelihood, the mushroom will not reappear at the same place the following season. As an example, one season we found a rare species, *Lepiota caepestipes*, on a heap of humus on Foster's Island. The next year our rare species had disappeared with half of the humus. The remaining pile was covered with huge caps of *Lepiota naucina* up to 12 inches across. Of course the humus pile was gone the following year.

Over a dozen seasons, our Arboretum checklist has grown to several hundred species, most of which are single specimens, not repeated. We record such notables as *Cantherellus cibarius, Cantherellus clavatus, Amanita muscaria, Psilocybe caerulescens, Stropharia ambigua* and *S. aeruginosa, Collybia dryphila, Coprinus comatus, Russula foetans, R. Xerampelina, R. emetica, Agrocybe praecox, Psathyrella velutina, Lepista nuda, Gomphidius smithii, Armillaria mellea, Leucopaxillus amarus, Rhodophyllus sinuatus*. There were many others that we were not able to identify. Out of some 2500 species in the Puget Sound flora of fleshy fungi, we consider this checklist to be unusually broad for such a small area. Given the variety of habitats and continually changing conditions in the Arboretum, we expect that the checklist will continue to grow.

Every season brings surprises for the mushroom hunter in the Arboretum. Those who have not been introduced to this interesting pursuit can get some idea of its fascination by looking downward occasionally. There is a whole world of beauty and variety available at the lowly level of your feet. ▲

The mountain ash, . . .
Decked with autumnal berries that outshine
Spring's richest blossoms, yields a splendid show
Amid the leafy woods.

William Shakespeare

Hardiness is a Sometime Thing

ESTHER BERRY*

Eucalyptus niphophila — *Photo by William Eng*

No question about it, the best guarantee of hardiness for garden plants lies in the selection of those kinds which have demonstrated their suitability for this climate. Fortunately, venturesome gardeners are not likely to accept such a limitation. The temptation to try something new, to experiment with plants that lie on the borderline of hardiness will not be denied because of a few losses. Of course it would be foolhardy to rely upon tender plants for the important structural pattern of the garden but they can add immeasurably to its interest. Even though they are likely to be killed or severely damaged in a bad winter, many tender things are still worth growing for the pleasure they give while they live. *Acacia retinodes* growing in a planting of yellow marguerites was a joy to behold for two whole summers before the winter of '68 took it off.

The challenge of growing plants that require a little extra skill or care is worth the gamble, even when one loses. It's a lot more fun to win, however, so perhaps it would be profitable to examine some of the factors that may determine survival or demise. At the outset, we should discard the belief that each plant has a definite temperature point below which it will not survive and that this compared with the probable low temperature for the area, will be a

*Esther Berry (Mrs. Robert), a faithful Foundation member who travels each month from Aberdeen to meet with the Editorial Board, contributes another fine article.

reliable indication of its chance for survival. This is really no more than a ball-park guess.

The nature of hardiness is very complex. Different species harden to different degrees and at different rates. Individual plants, within a species, vary in hardiness to such an extent that there may be only one member of a species which exhibits outstanding hardiness. Some kinds will be slow to harden in the fall but if protected until fully dormant, will be able to withstand the severe temperatures of mid-winter. Others will break dormancy so early in the spring that they may be damaged by late spring frosts and there are those, alas, that just do not have the capacity to harden sufficiently to endure some of our winters. In addition, there can be any of the several combinations of these liabilities. To compound confusion, the vulnerability of a species depends not only upon its ability to harden but upon the climate in which it grows and upon its culture as well.

Within reasonable limits, it isn't really possible to know how a plant will perform in your garden until it is tried—at least twice. Even so, a few guidelines can improve the odds considerably. To begin, select a sizable plant, if possible; most plants are hardier in age than they are when young, possibly because their growth slows down and there is more hard wood rather than soft growth. Plant in the spring rather than the fall, if possible. A well-established plant with a root system which can fully support it will have more cold resistance.

Another guideline is to determine the nature of the plant's tenderness before selecting a site. Is it slow to harden in the fall? If so, then it will need a position where it will not be over-watered in late summer. Plants from hot, dry climates are vulnerable to over-watering at any season. Does it have a tendency to break dormancy too early in the spring? If so, a south wall could be a disaster; plants with a northern exposure tend to harden earlier in the fall and start into growth later in the spring. Is it a risky subject from the standpoint of mid-winter cold tolerance? Consider the possibility of growing it in a tub that can be wheeled into the garage or some other shelter when the therometer dips. Otherwise put it in the warmest place available with maximum wind protection and perfect drainage. Be sure to put a few cuttings in the propagating frame each year—just in case.

The planting site should be selected with the utmost care for it is here that you are likely to win or lose. Temperatures can vary as much as 8° in the space of a hundred yards so take a therometer outside and search for warm spots. Take advantage of any protection that may be available; the overhang of a roof, the spreading branches of a tree—if the cover is not too dense—a lath shelter, a hedge or a wall, all may be valuable assets. Usually it is wise to choose a planting site on high ground, the colder air is heavier and drains away to the lower levels. On a hillside lot, beware of an obstruction, such as a hedge or a wall, which impedes this downward flow. The cold air may build up behind it and create a hazard rather than a shelter. This can sometimes be remedied by making an opening through which the cold air can drain away. Small depressions in the land should also be suspect. They may be frost pockets.

The walls of the house, the patios and walkways and the soil absorb heat during the day and this heat is radiated back when the atmosphere cools. Overhead cover helps to conserve this heat by reflecting it back to the earth. Walls and hedges prevent its being drawn off by the wind. Another important source of heat in need of conservation is that generated by the transpiration of the plant cells. Under cover of snow plants can generate enough heat in this manner, to enable them to withstand temperatures well below their normal tolerance. These two sources of heat have the effect of slowing down the fall in temperature and since the rapidity of temperature change is often more critical than the low temperature, it could be enough to provide the extra margin of cold tolerance needed by some kinds already close to the limit of their tolerance.

Wind protection is vital, not only to prevent loss but also because of its drying effect upon the foliage. When the ground is frozen, the roots are unable to take up water but evergreens continue to lose moisture through their leaves. A drying wind will make this situation still worse and cause desiccation.

An eastern exposure can be risky. After a frost, the early morning sun will reach the plants before they have had an opportunity to thaw and this can be injurious. If allowed to

thaw slowly, they may be undamaged. A south wall will provide the heat and protection that many sun-loving plants need to do well. However the extra heat may have a tendancy to promote lush growth late in the season or it may stimulate growth so early in the year that plants will be vulnerable to later frosts.

Strong healthy plants have more cold resistance than plants that are already struggling. Sound cultural procedures are therefore important. Promote strong growth in the spring with sufficient water and balanced nutrition so that there will be ample time for the soft growth to harden. After the first of August, the use of water should be reduced as much as possible without impairing the health of the plant. Generally, the lower the water content in the plant's tissues and the higher the mineral content, the greater its frost resistance.

Other things being equal, hardiness seems to be affected, to some degree, by mineral nutrients. Ample supplies of nitrogen produce soft vegetative growth and appear to reduce frost hardiness. For this reason, nitrogen should not be used after the first of June, unless the plant is really chlorotic, in which case, it may be the lesser of two evils. Potash and phosphorus are conducive to hardiness and may be used in late summer to speed the hardening process if warm wet weather has kept the plants in lush growth so long that the wood has not fully ripened.

A planting hole of generous size with soil suitable to the species and adequate drainage is important to hardiness and plant survival. Roots will not function properly if they are water-logged and the plant tissues will be full of water in winter. In the unlikely event that the soil should be dry in the late fall, plants should be watered before going into the winter. If frozen while dry, extreme desiccation would occur. Also the soil must be damp to secure the maximum benefits of heat absorption and radiation.

Most gardeners will not wish to undertake anything very ambitious in the nature of protective structures which can be a bit unsightly in the garden, and many feel that the effort is not worthwhile except perhaps in the case of a very rare plant. Still, there are several things that can be done quite easily which would meet with few objections. Protective coverings of various kinds can be useful, especially for small plants. Early fall freezes are particularly hazardous to plants which have not fully matured; if they can be protected long enough to permit them to harden fully, they may be able to survive.

A loose mulch around the base of the plant will prevent the ground from freezing deeply and will reduce the alternate freezing and thawing that comes with fluctuations of the temperature. The mulch should be of some material which does not decompose during the winter; bracken, oak leaves or beech leaves are fine. These can be held in place by small branches stuck in the ground. With somewhat larger plants, chicken wire or burlap secured to stakes driven in the ground can be stuffed loosely with the mulch. Evergreens should not be covered completely. However, a dense mulch which prevents the earth's heat from warming the air near ground level can result in the loss of small plants.

Bark splitting can sometimes be prevented in shrubs or small trees by a loose wrapping of burlap around the trunk. On trees the wrapping should extend to the crotch so that a new head could be built if the top growth is frozen.

Hotcaps, commonly used for early vegetables can be used to protect small plants; if these are too small, it is easy to make a larger version by pushing wire hoops into the ground and covering them with polyethylene. Be sure to put slug killer inside and don't put them in place until cold weather arrives or they may force new growth. A box, lined with aluminum foil, held above the plant by stakes driven into the ground provides good overhead protection with maximum heat reflection as well. Overhead cover is often as effective as cover for both the top and sides.

Cloth or canvas draped over the plants offers small protection for these materials have little insulating capacity. Where the leaves touch the covering, there is no protection at all. However, a heavy blanket may save a valuable plant.

If all of this seems like too much bother—it really isn't. Mostly it's a matter of careful placement and planting combined with sound cultural practices which any good plant deserves.

(Continued on p. 32)

TO REVEAL MEANINGS AND RELATIONSHIPS

(A further report on the Arboretum Nature Trail)

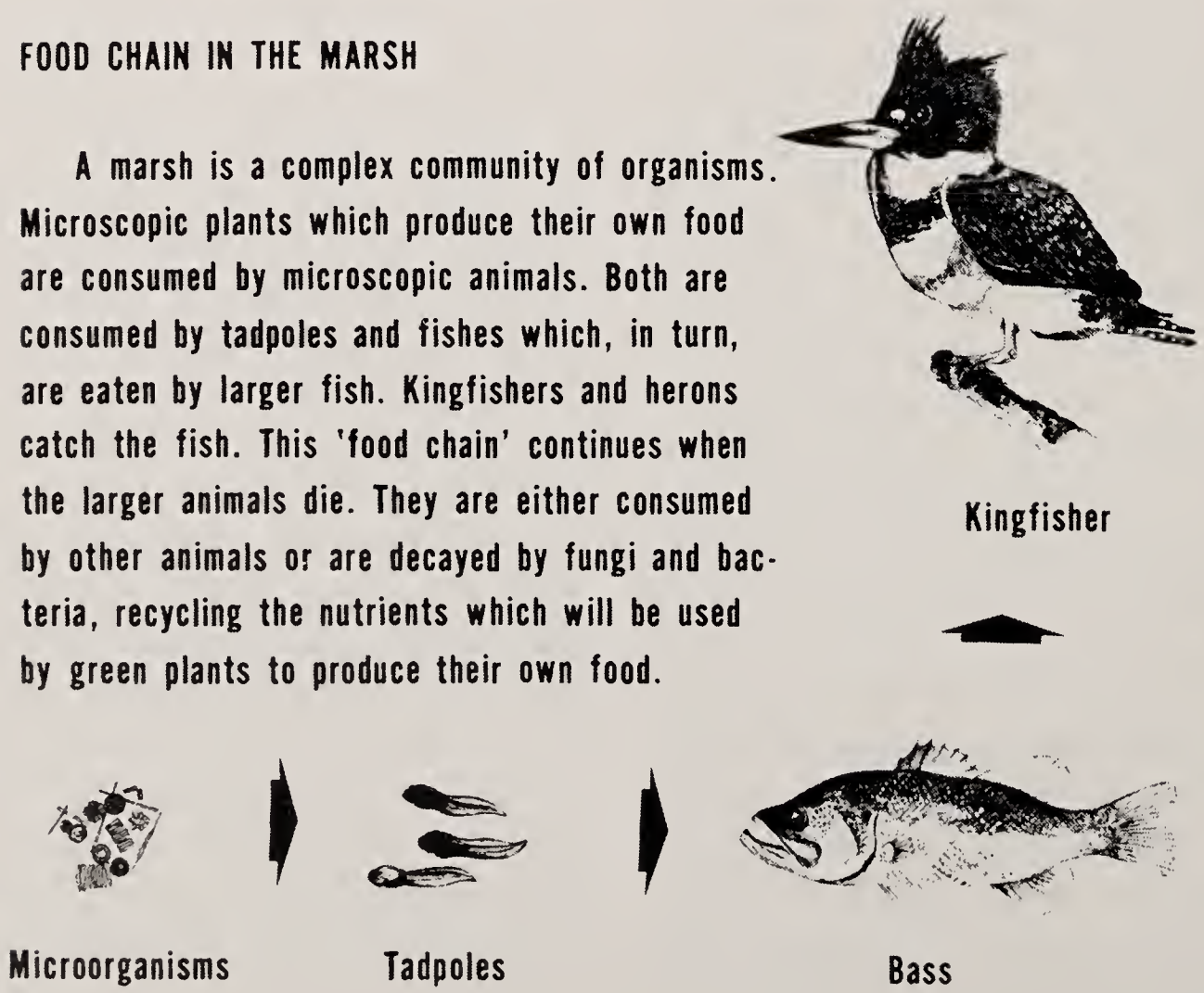
*GRANT W. SHARPE and PAUL MC INTOSH**

Interpretation** for the Arboretum Waterfront Trail and surrounding marshland has been in preparation for over two years. Students, professors, private citizens, and the Army Corps of Engineers have all contributed. Drawings, photographs, and carefully researched and precisely written labels for use on interpretive signs have been assembled. All of these contributions have been carefully examined to sift out the ones most appropriate for the trail. Those selected are being edited and condensed so that the final labels will be short, easily read, and informative.

The trail signs will fall into three arbitrary classes: orientation, natural history, and human history. At the starting points at either end of the trail, the first orientation sign will state the purpose of the trail and give credit to those responsible for its interpretation. Also near each starting point will be a sign to discourage activities that are not compatible with the purpose of the trail, such as jogging, riding motorized vehicles, littering, and flower picking.

*Dr. Sharpe is Professor of Outdoor Recreation in the College of Forest Resources. Mr. McIntosh is a graduate student in the same college, presently assigned to completing the trail interpretation.

**An educational activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media, rather than simply to communicate factual information. (Freeman Tilden. *Interpreting Our Heritage*, The University of North Carolina Press, Chapel Hill. 1967.)



Above: Sample of metal photo label to be used on Arboretum Nature Trail.

The interpretive labels will make visitors aware of the variety of plant and animal life that can be seen in the marsh. They will also explain some of the more subtle aspects of the marsh, such as the food chain and "marsh gas" production. Man's activities, some obvious and some not so obvious, have created and altered the marsh and are still changing it. These activities will be included in the interpretive story.

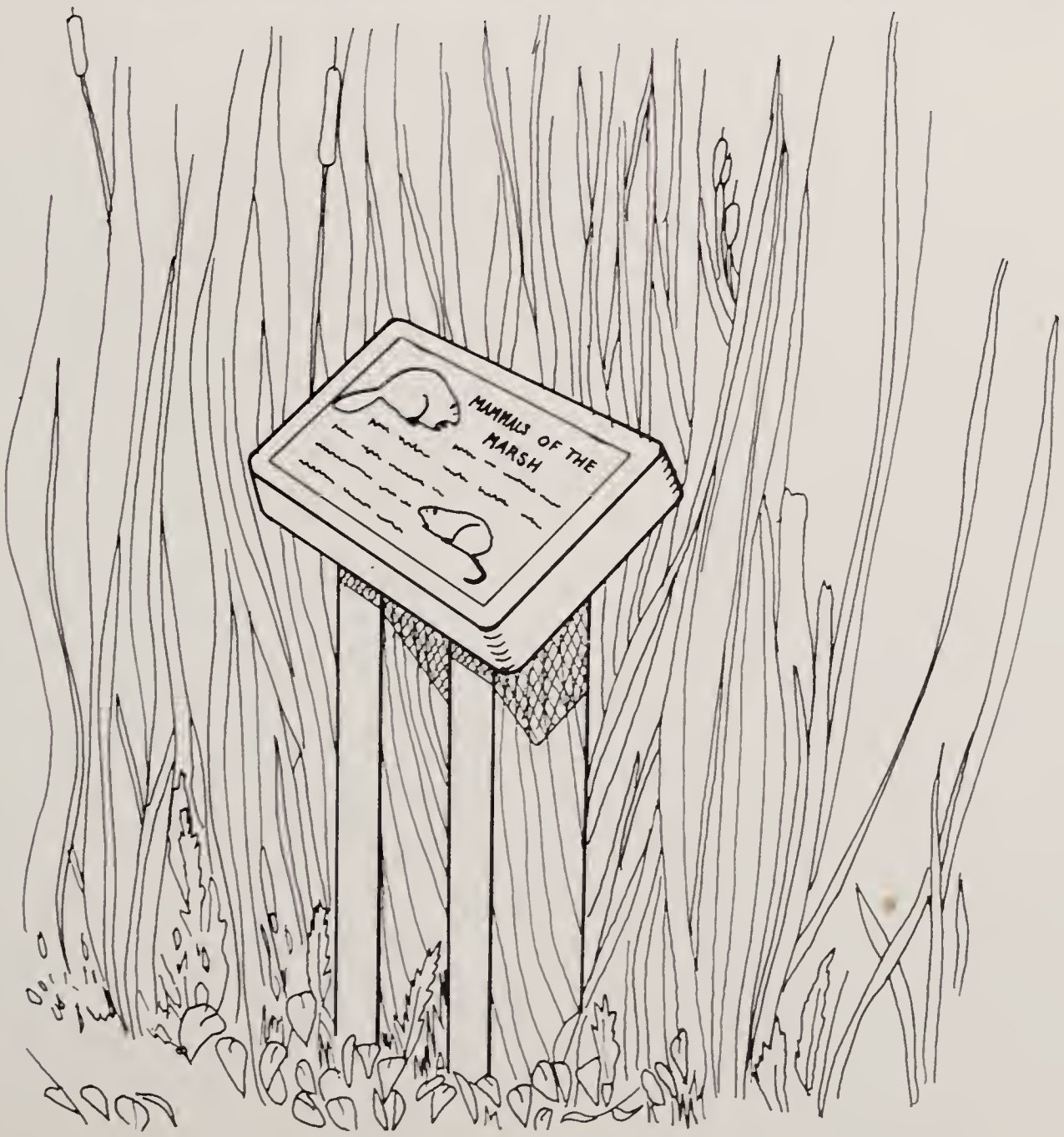
The information will be put on 10x12-inch sheets of anodized aluminum, using a Metal Photo process. A representative label is shown on the opposite page. To discourage vandalism, the University Arboretum Committee discussed different designs and materials for the label holders, and also different methods of affixing the labels to the holders. To minimize defacement of the labels, it was suggested that they be covered with plexiglass or a plastic laminate.

The final design of the label holders was turned over to Eric Hoyte, landscape architect at the University. His initial design appears below. At present, there are fifteen labels proposed for the trail. Their durability and public acceptance will help determine whether more labels should be installed.

For visitors wishing a souvenir of the trail, the committee suggested the possibility of having paper copies of the labels available at the Arboretum office. A trail sign could inform the public of this service.

When the interpretation is complete and the labels are in place, the Arboretum Waterfront Trail will provide a place where people of all ages can learn about man and nature in the marsh of Union Bay. A quiet place to walk, away from the pressures of the city, will be welcomed by many citizens.

Below: It is hoped this imposing holder will thwart vandalism.



BLOEDEL CONSERVATORY OF TROPICAL PLANTS VANCOUVER, B.C.

BERNICE FERRIER SMITH
Forest Resources Librarian — University of Washington

Vancouver, B.C. is the site of a new center for the display of living tropical plants. The Bloedel Conservatory, located at the top of Little Mountain in Queen Elizabeth Park, is in the geographical center and on the highest point in Vancouver, and covers an area of ten acres, including five and one half acres of concrete decking which enclose the city reservoir.

The Conservatory is built in the form of a dome 140 feet in diameter and 70 feet high in the center, and is formed from 30 tons of clear plastic bubbles, each one 9 inches high, but in 32 different shapes, ranging from 40 inches to 84 inches, set in an aluminum frame. The admirable effect achieved is that of a blending with the infinity of the sky and natural surroundings, rather than that of the conventional greenhouse enclosure. Architects were Underwood, McKinley, Cameron, Wilson and Smith.

Inside the dome, there are tropical finches, wood ducks and small quail from India, adding to the feeling of natural environment. Wood planked walkways extend throughout the Conservatory, and cross a pond fed by an artificial waterfall. The plants are arranged according to three climatic zones: tropical, temperate, and arid, with 24 mist sprayers to maintain the proper temperature and humidity. Some of the rarer specimens were imported, such as the *Butia Capita Palm,* but most of the plants, representing 13 different countries, were grown by the Parks Board in their own greenhouse.

In the concreted area outside the Dome, water gardens, reflecting pools, fountains, and benches for resting and viewing help to create a garden atmosphere and take away from the starkness and mass of the concrete.

The donor of this "Stately Pleasure Dome" is Prentice Bloedel, whose Bloedel Foundation financed the construction with a total cost of $1.4 million. A personal gift from Mr. Bloedel is a Henry Moore sculpture entitled "Knife Edge in two Pieces." It is one of three bronze castings made before the mold was destroyed. One of the other two castings is in the grounds of the House of Lords in London, and the other one is on the Nelson Rockefeller estate in New York. (Based on an article in *Plywood World,* Second Quarter, 1970, p. 2)

Henry Moore's sculpture, "Knife Edge in Two Pieces," provide a dramatic contrast to the gigantic plastic bubble dome.
Right: Tropical plants luxuriate in temperature and humidity con trolled atmosphere inside a portion of the Bloedel Conservatory

Hydrangea aspera subsp. aspera.—*Photo by: Don Normark*

HYDRANGEAS AS GARDEN SUBJECTS

MARY WINSLOW *

Hydrangeas are not only beautiful plants but are very interesting. They are relatively disease and insect free, need little care and supply us with continual color all summer long. They are interesting because, although the same species of shrubs, they vary not only in appearance but in likes and dislikes.

Hydrangeas first came to the attention of the Western World when in 1775 Carl Peter Thunberg stayed on an island near the coast of Japan, where he found occasional flowers or his friends brought them to him from Japan. There he found the globose headed flower which he called *Viburnum macrophyllus.* This was later more correctly named *Hydrangea macrophylla* keeping the specific name. He also found one he named *Viburnum serratum.* These and a few other dried flowers Thunberg took back to Sweden, where they were put in the Herbarium at Uppsala. Later a living plant was brought to France and in 1789 was named Hortensia after a French girl. This name, therefore, has become the designation for all globose headed hydrangeas. In that same year a live plant was also brought to England, by an agent of Sir Joseph Banks. This was a Chinese hydrangea of a greenish color and many similar plants are still found on the coasts of England. Much later, Mr. Haworth-Booth named this plant after Joseph Banks. In 1830 Siebold imported plants. Drawings and descriptions of them are in the fine volume written in French by Siebold and Zuccarini. From time to time thereafter hydrangeas were imported and many name changes occurred, so terrible confusion arose. It was not until the well-known author and

*Mary Winslow (Mrs. Kenelm) is a long time Foundation member, a former member of the BULLETIN Editorial Board and an able hydrangea authority. We welcome this informative article from her.

botanist, Mr. Michael Haworth-Booth wrote his excellent book, *"THE HYDRANGEAS"*,[1] that correct nomenclature was established and a complete history and glossary recorded of all known hydrangeas, both species and macrophylla garden varieties. This authoritative book, written in English, was first published in 1950, and covers their history, care, pruning and breeding. It is a most interesting readable book for either the horticulturist or the amateur, and has been used as resource for this paper. Rehder, of course, in his manual[2] has described a number of hydrangeas and more recently Dr. Elizabeth McClintock has written a monograph[3] of the Genus *Hydrangea*, but both are written in botanical terms and often difficult reading for the novice.

These plants provide us with more blooms than any other summer plants I know and do not drop untidily nor require much removal of spent flowers. Color varies from the palest pinks, blues and greens to shades of cambridge, medium blue, rose, cherry, red, violet and purple, depending on their heredity and the pH of the soil. Many whites are sometimes quite reliably hardy and resistant to sun.

In all about 500 forms of *H. macrophylla* are divided into two sections, the Hortensias and the Lace-caps. The former has the bun shaped head, the latter, flat corymbs, with ray flowers around the perimeter or occasionally sprinkled through the central fertile flowers. The Hortensias are not unattractive but often very lovely. The French growers prefer these for potted plants which in the spring in foreign cities are seen everywhere in window boxes, garden courts and other points of vantage. As garden shrubs, hydrangeas are very effective or when cut make beautiful arrangements. They may vary in size from tiny tray ornaments about 6 inches high through dwarfs or huge specimens, some with small, dainty flowers, some large and brilliant. Therefore, when planting, they must be placed in surroundings conducive to their final attainments and preferences for soil or sun. Some like dappled shade while a few prefer full sun or morning sun. The former will wilt or burn if in too hot an exposure while the latter become leggy and finally fall procumbent. Their color, of course, depends on their heredity but the pinks and reds require neutral or alkaline soil, the blues or purples acid. The latter are very much at home among rhododendrons. Almost all hydrangeas except giant plants like *H. aspera subs. Sargentiana* look well along drives or garden walks or in groups.

I first became interested in hydrangeas when living on Bainbridge Island where I had a very favorable garden situated on top of a cliff with sea breezes, good air and water drainage, and fine soil although somewhat alkaline. A few very nice potted plants were given to me including a handsome red. They were put into the ground when spring came. Being very green, except for my thumbs, I put my red in amongst my rhododendrons where I had used acid fertilizers as well as epsom salts. Learning of my mistake, I switched it for one that had been blue but evidently not a very ready "bluer". This turned out to be a fortunate misfortune. It became a beautiful and unusual speciman attaining a height of six or seven feet with three different colored flowers, dark blue, violet and rose pink which have never changed. This phenomenon I cannot understand or explain. Some plants of *H. macrophylla* do not change color readily, but sometimes become a rather ugly color. The *H. m.* 'Heinrich Seidel', a nice cherry red in alkaline soil, with acid soil become a hideous lavender, which in time might have become a good blue. The 'Blue Wave', while not a ready "bluer", when properly fed becomes a beautiful blue but should be in soil about pH .5 with occasional feedings of aluminum sulphate and iron sulphate (one quarter of an ounce each to a gallon of water poured on the ground). Care, however, must be taken not to give *H. m.* 'Blue Wave' too much aluminum. It is a striking and very floriferous Lace-cap, being covered from early July with large corymbs. The fertile flowers deep blue until they turn brown from exposure to the sun are lovely with the ray flowers large and lighter

1 Haworth-Booth, Michael: *THE HYDRANGEAS*, 3rd Ed., 1959.

2 Rehder, Alfred: *MANUAL OF CULTIVATED TREES AND SHRUBS HARDY IN NORTH AMERICA*. MacMillan, Revised Edition, 1967.

3 McClintock, Dr. Elizabeth. In Proc. Calif. Acad. Sci., 4th Ser., Vol. XXIX, No. 5, pp. 147-256 (Nov. 1957).

blue with four or five serrated sepals which turn dusty pink in the fall. The leaves are medium dark green, oval, serrate and acuminate. They are hardy in light shade but cutting them down or fall pruning can be fatal. *H. serrata* 'Grayswood' is a beautiful plant and although a Lacecap is entirely different from the former, more delicate in form and physique. It is tall with slender branches, the leaves elliptic and acuminate. The corymbs are dainty, starting to bloom in June and lasting until December in mild weather. When first opening they are white, pale green or pink gradually changing in color to red. This change is invariable and the colors always remain the same; that is, no matter how acid the soil, they are never blue. It is a rare plant, likes light shade and cannot grow well in alkaline soil.

After selling the country place, we bought a house in town with very acid soil. After some years of applying lime to my soil, I am succeeding in having a few pinks and one dark red. My *H. m.* 'Heinrich Seidel', a ramet from my original plant, is a nice cherry red although it burned and wilted in excess sun this hot summer. One *H. m.* 'Vulcain' is a rosy pink; the other in an unfavorable spot is a rather pale cambridge blue but it also has wilted. This tendency of some to wilt may be due to my poor soil which is a heavy blue sub-soil and has a high water level.

One of the choicest plants in my garden and most unusual is *H. m.* 'Lanarth White', a hybrid Lace-cap, an early bloomer, loves the sun and is quite sturdy. It is informal in appearance covered with very white irregularly shaped inflorescence with light green slender elliptic leaves. 'Thomas Hogg', which will sport from 'Lanarth White', while not an unattractive plant, is inclined to take over, so watch for this and remove the shoots at the base. The former, a rare plant in the United States, is a delight in any garden.

A great favorite of mine is *H. m.* 'Amethyst' produced in the nursery gardens of Mr. Michael Haworth-Booth in England. A charming medium-sized hydrangea, in my garden it is under a cherry tree with nice, light shade, doing very well. It has double florets and ruffled serrated sepals, pale blue and shot with amethyst, a truly enchanting graceful shrub. The only other double sepal plant which I have is *H. m.* 'Domotoi'. This has very irregular heads coming out pale green then turning white and intermingled with blue sepals. It is a vigorous but medium grower and if over fertilized becomes strangely distorted. Most people find this plant very attractive. Although both of the above are Hortensias, the inflorescences are flat.

A hydrangea quite different from most is one I believe to be *H. m.* 'Ayesha' commonly called lilac-like as the sepals are like those of a lilac in shape and in color, with flat heads and small florets with entire sepals which are reflexed. This type can take sun.

I had a beautiful sturdy large white flowered plant which I had gotten from a greenhouse, and I was anxious to have more. Mr. Mulligan very kindly gave me some seeds of *H. cinerea*, a species. The corymbs are small with just a few ray flowers. The branches and undersides of the leaves are downy, the upper bright green. It is an interesting specimen although not very showy. This plant comes from the eastern southern states but seems relatively hardy. Another hydrangea from the southeastern U.S. is *H. quercifolia*, the oak-leaved hydrangea, a handsome plant, for aside from its large panicles of white, sweet-smelling flowers with numerous sterile flowers throughout, the lobed oaklike leaves turn bright red in the fall. Although somewhat tender, it seems reasonably hardy in many gardens and is well worth trying.

Several more white plants, none as handsome as either my *H. m.* 'Lanarth White' or my original beautiful globose headed one are recent acquisitions. One is a fast-growing, very free-flowering Hortensia which layers itself quite profusely, and likes a sunny location. One of these is full south sun. The flowers have burned somewhat this summer in this place but not badly, so it is very amenable as well as ornamental. It would be advisable in buying unnamed plants to place them in medium shade until their preferences are knwon.

A nice small dark red Hortensia, named *H. m.* 'Souvenir du President Doumer', was moved recently and placed under a small cherry tree where it has filtered shade as well as sun from

Hydrangea quercifolia, Univ. of Washington Arboretum.—*Photo by: E. F. Marten*

Hydrangea Sargentiana, Co. Down, N. Ireland.—*Photo by: B. O. Mulligan*

the west. Sometimes after transplanting, plants may change in color. I hope in this more favorable location it will again become a nice clear red.

Several large leggy hydrangeas have enormous hairy leaves. One, *H. Sargentiana*, requires shade, considerable moisture and space as a specimen in a large garden, is interesting, but to me not very good looking. Others belonging to the *Asperae* sub-section are smaller and much more attractive. One *H. aspera subs. strigosa (macrophylla)* has hairy leaves, purplish corymbs and is quite decorative. It is sometimes found in nurseries, likes light shade and reasonable moisture.

Rencently in the office of the University of Washington Arboretum I saw a most beautiful inflorescence of *H. paniculata* var. *praecox.* I had never seen the shrub itself nor the flowers which had a heavenly scent. The corymb was not flat but tall and straight and the sterile ray flowers grew out from the sides of the flower head interspersed with the fertile. It was beautiful and striking and probably the plant itself is quite large. This is a poor description but the plant is most worthy of being mentioned.

There are quite a few climbers but as most come from tropical climates, are not hardy enough for the United States and England, except two deciduous vines. One, the *H. petiolaris* grows and thrives in the Pacific Northwest and makes a fast growing ornamental covering for the side of the house, on a fence or up a tree and requires little attention because it clings by aerial rootlets. The corymbs are somewhat irregular with from four to ten ray flowers with greenish or dull white entire sepals. The fertile seeds on long petioles branching out from stems also holding the ray flowers gives the inflorescence a lacey look. This can be used effectively in flower arrangements. My vine grows in a very damp shady location and has oval dark green leaves. The old bark, however, is dark brown. Don't plant it against your house if you paint often, as the old branches torn from the wall will not cling again. So it would have to be firmly tied on, or cut down and started over which might be injurious. One or two other climbers may be hardy, but *H. petiolaris*, obtainable from local nurseries, is better known. These climbing hydrangeas should not be confused with *Schizophragma*, although they are somewhat similar in appearance. The latter can be easily distinguished by the single sepal in the sterile flowers of the corymb.

Unfortunately few nurseries in the United States carry many hydrangeas or feel any regard for their proper nomenclature and most are not named at all. Only a very few are labelled. As a rule, these plants are not sold by the firm which grew them and come unmarked to the seller, who knows little or nothing about them. In the spring one often finds handsome well grown ones in florist shops, but as usual no name. Some plants produced in hothouses, however, are not good garden subjects. Nurserymen who say people do not buy hydrangeas are undoubtedly correct. Because the plants do not start blooming until early summer, and spring and fall are usually the active buying season, no plants are in bloom to show the customer. In the autumn they may be faded or burned. In England one sees beautiful specimens in bloom at Chelsea or the Horticultural Society shows. The average plants one sees in most gardens in this country are poorly tended ones of a skim milk color which are hardy but common and have to stand any amount of mis-treatment. However, due to sales at the Arboretum or Orthopedic Hospital one can sometimes find nice hardy little plants grown in private gardens whose owners have imported plants.

Importing hydrangeas involves considerable effort and time. Due to some serious diseases originating on the continent of Europe, hydrangeas come into this country under post-entry quarantine. This means that it is necessary to have a license to import, then bring usually quite small and bare-root plants in by air. These plants taken by a broker to quarantine where they are sprayed and disinfected, possibly arriving in a delicate condition. This, of course, is a great protection to gardeners and farmers alike and should never be violated by thoughtless people. Overcoming all the difficulties involved in importing requires a great deal of trouble and expense. Unless one is a hydrangea enthusiast he will buy other varieties of plants readily available in many of our fine nurseries in this country.

Seeds from most plants can, I believe, be imported. This may not include hydrangeas but raising from seeds is, of course, slow and tedious. Most hydrangeas, however, can be grown easily from cuttings and layering is quite quick and simple. A few do not strike easily while some can be just stuck in the ground. In any case they must be kept damp and if in hothouses or coldframes pinched back. In open ground they should be allowed to go through the first winter without pinching. A light in the coldframe is a good protection against unusually cold weather. Most of my little plants have weathered in our mild climate without trouble. For me, as we are away a good deal, layering is the easiest.

The care of hydrangeas is reasonably simple. Pruning, except for light summer pruning, must be done in the spring, and as a rule just taking off the spent heads at the first good bud is sufficient with, of course, the removal of any dead wood, some old and overgrown stalks as well as part of the new soft growth, if too much has come up from the bottom. During a very cold winter or with heavy early frost, one must watch for freezing and immediately cut away all frozen leaves and branches to the ground if necessary. One of my plants was so severely damaged in 1964 by very cold weather, after a mild autumn, that it is not yet sufficiently strong and just now is beginning to bloom well. This was due to excessive winter pruning, although in this case necessary, and followed later by new soft growth. *H. m.* 'Blue Wave' can be ruined for good by cutting down at any time or pruning in the fall. Once a gardener cut down my *H. quercifolia.* Shortly afterwards a heavy frost succeeded in killing the poor plant. The brown flower heads left on during the winter do not look badly. If you have many hydrangeas, it can be rather tedious removing the brown heads in the spring, but rewarding. For while on the bush they have provided the plants with aluminum sulphate naturally and the aluminum and acid soil intensifies the blue color.

Hydrangeas are not troubled with many diseases. The worst I have encountered is Botrytis. When the tender young growth starts it should be watched and if wilting or browning of the tip at the base like a burn is noticed, immediately sprayed with a good fungicide, twice may be necessary, picking off and burning all affected parts.

I hope this article will help to interest gardeners in these lovely flowers as well as clear up some of the unfortunate errors in growing and especially pruning hydrangeas. ▲

FOUNDATION OFFICERS

These officers, elected at the 35th Annual Meeting in June will direct the activities of the Foundation for the coming year. Front Row, l. to r. – Phyllis Cavender, Secretary; Robert J. Behnke, President; Mrs. H.P. Clausing, Vice-President. Second Row, l. to r. – M. Chris Johnson, Vice-President; Joshua Green, III, Treasurer; John Putnam, Vice-President. Mr. L. James Brady, Vice-President was absent when picture was taken.

Photo by: Joy Spurr

Hardiness is a

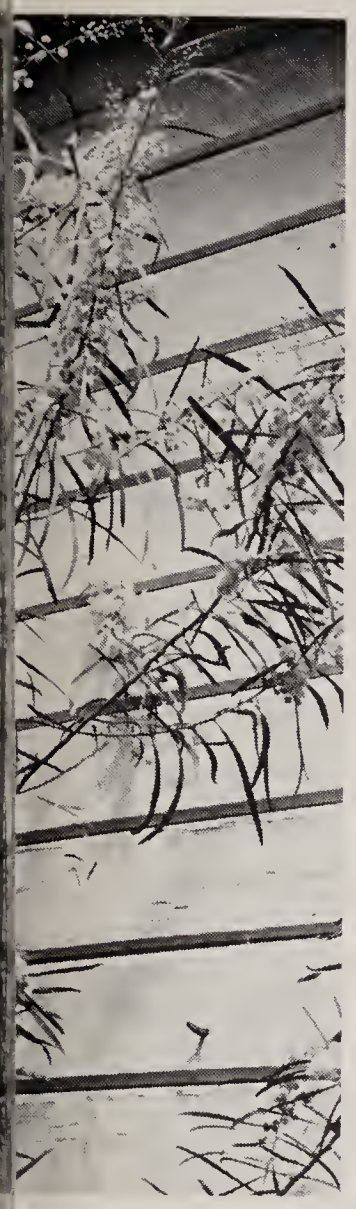
Carpenteria californica — *Photo by B.O. Mulligan*

Acacia retinoides —
Photo by B.O. Mulligan

Eucalyptus niphophila — *Photo by William Eng*

Hoheria glabrata —

Sometime Thing



Fremontia napensis — *Photo by B.O. Mulligan*

oto by William Eng

Magnolia Campbellii — *Photo by B.O. Mulligan*

REPORT ON THE UNIVERSITY OF WASHINGTON ARBORETUM
July 1, 1969 – June 30, 1970

BRIAN O. MULLIGAN

1. Improvements and Maintenance

The principal event in the late summer of 1969 was the International Botanical Congress. Additional labor hired previously, from the end of March to the end of August, totaled seven men who worked for 40 weeks. Of these, four were on State funds, three on non-University funds. From the total cost of $7,050.33, $2,000.00 was donated by the Arboretum Foundation Unit Council in February 1969.

Work done in late summer included hauling 300 yards of old stable manure from Kenmore (at .50 yd.); laying a large new drainage system over 500 feet in length through an azalea bed just west of the picnic tables; spraying blackberry colonies in various places, the large grass areas for broad-leaved weeks, and the juniper collection three times for the die-back disease which afflicts them.

In October we borrowed the high lift equipment from the campus and pruned overhanging branches along Arboretum Drive and on the Boulevard near Madison St. 2,800 lbs. of fertilizer was applied on all grass areas in the upper part of the Arboretum, on Foster's Island and around the lagoon. On areas of heavier soil we spread nearly two tons of ground limestone. The cherry trees along Azalea Way were sprayed with a dormant sulphur spray immediately after leaf fall, to assist in controlling the wilt and die-back diseases.

During November 300 lbs. of Casoron was applied to borders along Azalea Way and Arboretum Drive, primarily to control horsetail. Another drain 350 feet long was dug and tiles laid in the grass outside the service entrance to the Japanese Garden, a very wet area. In January we started clearing most of the young alders and willows which had sprung up in the low area adjacent to the approach to the Evergreen Point bridge, on the extreme northwest edge of our property, but leaving sufficient trees to form a continuation of the existing grove of native alders beside the water channel. Following this, we removed much brushy growth on the north side of Foster's Island and also cleared the bank on the east side of the Boulevard south of E. Lynn St. for about 1/3 mile. Several extra men obtained from the Compass Center in Seattle materially assisted in accomplishing so much.

In this month also a dormant spray was applied to the crab apples, hawthorns, lindens and other deciduous small trees—1,000 gallons in all. One man was occupied in pruning the roses and pyracanthas along the Broadmoor fence, continuing with the collections of *Deutzia, Philadelphus, Hydrangea* and then the shrubs around the parking lot at the E. Lynn St. bridge.

During March we used some of the old stable manure to mulch a large part of Rhododendron Glen, particularly the oldest and largest plants, and later all the borders in the Japanese Garden, a task which occupied two or three men for three weeks. In April preparations for construction of the machiai, just north of the tea house, required another short drain to be dug to remove surplus water from the site.

Several days were spent by Mr. R. Yamasaki and a small crew in thoroughly pruning the trees in the Japanese Garden, under contract funded by the Arboretum Foundation. The results were most satisfactory, judging from the comments made later by visitors.

About the middle of that month we started spraying against tent caterpillars, but fortunately this is a light year for those pests. The holly collection was sprayed as usual in mid-May for leaf miner. The logs along the south side of the parking lot on the Boulevard just north of the Japanese Garden were replaced by concrete blocks constructed here during the winter. Eventually we hope to replace all logs in the same way around other parking places.

2. **Acquisitions**

(a) **Seeds**

A total of 300 packets have been received during this period, from 50 botanical or horticultural institutions and a large number of other donors. Some of these were collected in such places as the Tian-Shan mountains in central Asia, the mountains of S. Australia, in New Zealand, southern Chile, the mountains of Jalisco in west central Mexico, from Lapland and Finland, the Canary Islands, Turkey (*Pinus nigra* 'Pyramidata'), Corsica, Tunisia, Sikkim and Kamtchatka—an astonishing geographical range.

(b) **Plants**, including scions and cuttings (278 items)

Collection of peonies from Miss Saunders, Clinton, N.Y. (6 plants) donated by Unit #35.

Collection of rhododendrons (14 species) and other plants, total 36 plants in all, from Mr. and Mrs. Page Ballard, Issaquah, Wash.

Five species of *Eucalyptus* from Tasmania, donated by a graduate student in the College of Forest Resources (W. Crane).

From U.S.D.A., Glenn Dale, Md. Collection of young trees and shrubs from Korea, India and Burma, 15 kinds (11/69). Five kinds of shrubs and trees from Taiwan, Japan and Korea (3/70). Collection of eight kinds of *Rhododendron* species from Taiwan, and two new azaleas (34 plants) (4/70).

From Saratoga Horticultural Foundation, Calif., purchased five plants each of three *Arctostaphylos* hybrids and two *Ceanothus.*

Collection of 18 dwarf conifers and eight *Rhododendron* species and hybrids from a nursery in Connecticut.

From Dr. Robert Ticknor, Aurora, Ore., five species of *Eucalyptus* from Tasmania.

Nine *Rhododendrons* purchased from Mrs. A. Lem, Seattle, Unit #25.

Scions of 25 kinds of trees and shrubs, sent by Longwood Gardens, Kennett Square, Pa. All introduced from Europe by U.S.D.A. in 1959.

From U.S. National Arboretum, collection of seven kinds of shrubs and one tree from various sources. Three new hybrid hollies, ('Accent', 'Elegance'; 'Oriole').

From the University of California, Davis, (Dr. A. Leiser), stocks for and scions of 13 virus-free Japanese cherries. Good results obtained in grafting here.

(c) **Books**

Since 7/1/69, 64 titles have been added to the library by purchases, gifts, and a few sent for review from publishers. Included are:

VASCULAR PLANTS OF THE PACIFIC NORTHWEST; Pt. I, edited by Dr. C. L. Hitchcock (Seattle, 1969)

BOTANICAL AND ZOOLOGICAL DRAWINGS, by William Bartram, 1756-88; edited by J. Ewan (Philadelphia, 1968); gift of Hawthorn Hills Garden Club.

HISTORIA PLANTARUM, by John Ray, Vol. I only, (London, 1686)

ENDEMIC FLORA OF TASMANIA, Pt. II, W. Curtis & M. Stones, (London, 1969) Gift of Arboretum Unit #75

WILD FLOWERS OF GREECE, by C. N. Goulimi and N. A. Goulandris (Athens, 1969). Gift of Unit #36

EXOTIC BOTANY, by Sir J. E. Smith, 2 vols. (London, 1804-08) Bloedel Foundation.

ERICAS IN SOUTH AFRICA; H. G. Baker & E. G. Oliver, (Johannesburg, 1967) Donated by Unit #8

WILD FLOWERS OF THE UNITED STATES, vol. 3, Pts. 1 & 2. (New York, 1966) Donated by Isaacson Corp., Seattle

CURTIS' BOTANICAL MAGAZINE, vols. 17-26; (London, 1803-07) Gift from Arboretum Foundation Library Fund

RELATION D'UN VOYAGE DU LEVANT; P. de Tournefort. Vols. 1 & 2. (Paris, 1717). Donated by Arboretum Units #8 and #43

PLANTAE LIGNOSAE IMPERII AUSTRIACIS; A. Pokorny. (Vienna, 1864).

ICONES PICTAE PLANTARUM RARIORUM; Sir J. E. Smith. Vols. 1 & 2, (London, 1804-08). Gift of the Bloedel Foundation

SYMBOLAE AFGHANICAE; M. Koie and K. H. Rechinger. Parts 1 - 6. (Copenhagen, 1954-65)

TREES OF SOUTH AFRICA; Eve Palmer and Norah Pitman. (Amsterdam and Cape Town, 1961)

CAMELLIAS OF JAPAN; Edited by T. Tuyama. Vols. 1 & 2. (Osaka, Japan, 1968). Gift of Mrs. A. R. Kruckeberg.

SHRUBS AND VINES FOR AMERICAN GARDENS; Donald Wyman, Revised and enlarged edition. (Toronto, 1969)

THE STORY OF THE ROYAL HORTICULTURAL SOCIETY; H. R. Fletcher. (Oxford University Press, 1969)

(d) **Equipment**

Kodak Carousel Projector with zoom lens and case, from Unit #25.

Wollensak tape recorder, with case, from Unit #25

(e) **Special Donations** ($100 or more)

Arboretum Foundation, for pruning in Japanese Garden	$ 1,000.00
For construction of machiai in Japanese Garden; (additional to original gift from Mr. Bloedel)	1,535.00
From Education Committee of Arboretum Foundation for library (expenditure to this date, $890.00)	1,000.00
Arboretum Unit Council, for Educational use	1,000.00
Special Equipment	1,000.00
Travel Fund	1,000.00
Summer Maintenance	2,000.00
Unit #25, (Mrs. H.W. Bell), for plants, $250.00, for books, $250.00	500.00
Unit #25, for slide projector	250.00
tape recorder	175.00
Unit #8, for library	100.00
Unit #27*	100.00
Seattle Garden Club, for maintenance of Azalea Way	500.00
West Seattle Garden Club, for Woodland Garden	100.00
Stimson Reed Foundation	100.00
Mrs. A.R. Kruckeberg, for any purpose in Arboretum (Utilized for maintenance)	470.00
Mrs. Walter Wyckoff	200.00
Memorial to Kelly Nishitani; from Bonsai clubs of Seattle	642.31
From Friends of University of Washington Arboretum	950.00
Other smaller donations	110.00
Friends of the University of Washington Arboretum for various specified purposes	10,254.00
TOTAL	$22,786.31

*Editorial Comment: Additions to the Building Fund, which is invested as noted in the Financial Report published on the Inside Rear Cover, include $507.92 from Units plus accrued interest of $1,214.71. The reader will note that the Director's report, conforming to the University year, spans a different time period than that covered in the Financial Report.

3. **New Plantings**

Eleven plants were added to the collection of shrubby peonies beside Arboretum Drive; more dwarf conifers and rhododendrons placed on the bank below the Lookout, and additional low types of junipers on the steep bank near the head of Rhododendron Glen.

To the west of the Japanese Garden, as well as inside it, we planted more evergreen trees for future screening purposes, including *Cryptomeria, Chamaecyparis,* and redwoods. Six kinds of willows were located in a low damp area just north of the Boulevard, amongst our native alders, and five large rhododendrons moved from near the service building to a new home near the lagoon, just north of the last site.

A new planting of six species of *Vaccinium* was made close to the drinking fountain and parking area beside Arboretum Drive; five new *Sorbus* added to the collection, including some of the new hybrids from the Netherlands, and 24 plants of *Eucalyptus*, representing eleven species, planted in two different areas for testing.

The total number of trees planted this season was 130, of 92 kinds; of shrubs, 528, of 200 kinds.

4. **Plants and Seeds Distributed**

A list of 35 kinds of surplus small plants was sent in September 1969 to 40 other institutions or individuals with whom we correspond. 15 collections of plants were distributed as a result of this offer, to the New York Botanical Garden, the U.S. National Arboretum, Washington, D.C., Brooklyn Botanic Garden, Callaway Gardens, Pine Mountain, Georgia, and Arcadia, Calif., among other places. In addition, some 30 other consignments of plant material were shipped during the last six months of 1969 to institutions and nurseries. Scions or cuttings of Japanese maples and *Rhododendron* species were especially in demand.

Two lots of seeds went to France following the International Botanical Congress; cuttings of a juniper to Sweden in November. This year 27 parcels have been sent out, including plants of *Crataegomespilus* (from Poznan, Poland, in 1969), and *Betula Jacquemontiana* (from the Jardin des Plantes, Paris, 1969) grafted here by our propagator.

Seed Exchange

Our exchange list for 1970 contained 234 items as compared with 283 in 1969 and 238 in 1968. Members of Arboretum Unit #25 again carried out the laborious work of filling the packets and making up the 214 orders we received, between January 15 and June 4, 1970, totalling 3,244 packets. This compares with 3,447 in 1969 to 194 correspondents, and with 3,500 packets in the spring of 1968. Some of the most popular items were our native western dogwood *(Cornus Nuttallii)* and *Mahonia nervosa*; of cultivated plants *Magnolia Sargentiana* var. *robusta, Cupressus pygmaea, Nyssa sylvatica* and *Rhododendron Wardii.*

5. **Staff**

There have been no changes in the permanent staff during this period. As mentioned earlier, one man hired temporarily in January remained with us through June, being supported by non-University funds for the last two months. We employed a girl assistant to the propagator part time in the greenhouses from June 23, 1969-February 27, 1970, then a boy to replace her from late March to June 8, 1970.

6. **Advisory and Educational Work**

(a) **Advisory and Extension Services**

The Arboretum staff continues to serve local gardeners as a source for horticultural information. During the year from July 1, 1969 to June 30, 1970 some 3,171 telephone inquiries were received, the majority requesting some form of gardening help; in 1968-69 there were 3,101, and in 1967-68, 2,615.

A new service was offered to the public starting January 1970 when, in cooperation with Dr. Charles Driver, Miss Sharon Collman and others of the College of Forest

(Continued on p. 34)

The Arboretum Bulletin
Vol. XXXIII, No. 3 Seattle, Wn. Fall 1970

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9 a.m. to 4:30 p.m., Monday through Friday
Phone EAst 5-4510

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SPECIAL NOTICE

To keep membership in the Arboretum Foundation in good standing, dues should be paid during the month payable. Active memberships more than three months in arrears will be dropped and The Bulletin will be discontinued.

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- ☐ Life $500.00
- ☐ Sponsor . . . . . .$100.00 to 500.00
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The Arboretum Foundation,
University of Washington Arboretum
Seattle, Washington

I hereby apply for membership in the Arboretum Foundation and remittance for same is enclosed to cover dues for the next succeeding 12 months.

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UNIVERSITY CLASSES

Open to Foundation members and the public in general are three classes coordinated and supervised by the University of Washington College of Forest Resources. For additional information, phone 543-2730.

PRUNING ORNAMENTALS Chico Narro, Arboretum nursery foreman, will demonstrate techniques of pruning trees and shrubs. Saturdays, Nov. 7 and 21; 10 a.m.-noon; Arboretum greenhouse; 2 sessions, $5.

WINTER PROPAGATION Richard van Klavern, Arboretum propagator, will present a demonstration of seasonal techniques for propagating woody plants. Materils furnished; each section limited to 10.

Section A: Wednesdays, Dec. 2 and 16; 1-3 p.m.; Arboretum greenhouse; 2 sessions, $16.

Section B: Thursdays, Dec. 3 and 17; 1-3 p.m.; Arboretum greenhouse; 2 sessions, $16.

BONSAI CULTURE FOR BEGINNERS Mrs. Horace Raphael, authority on Bonsai culture, will present a series of 10 workshops for beginners. At conclusion of course, students should be able to select, plant and maintain both coniferous and deciduous bonsai specimens. Material will be furnished. Class meets on main campus; detailed schedule available upon registration.

Tuesdays, Oct. 6, 13, 20, 27, Feb. 23, March 2, 9, April 13, May 11; 7-9 p.m.; 10 sessions, $30.

PLEASE MENTION THE ARBORETUM BULLETIN WHEN BUYING FROM OUR ADVERTISERS

DR. SCHMITZ' BOOK TO BE PUBLISHED

A long felt want for a complete history of the University of Washington College of Forestry and the Arboretum is about to be filled by the publication of Dr. Henry Schmitz' book on that subject. Completion of the book and its publication was interrupted by the untimely death of Dr. Schmitz.

Details of early citizen and College of Forestry concern about the ecology and conservation of the state's forest resources and the Arboretum are recited together with a fascinating amount of local history and fruitful effort on the part of the College of Forestry, the City of Seattle and civic-minded individuals.

In order to preserve this local history the Arboretum Foundation has agreed to underwrite the publication of the book. Publication date has not been set but should be early spring.

Watch for future announcements.

—GORDON D. MARCKWORTH

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PATIENCE, FROST!
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THERE WILL BE NO MORE
WHITE CHRYSANTHEMUMS

OEMARU

This is your Arboretum, kept alive by your support

WE ARE PLEASED TO WELCOME THE FOLLOWING NEW MEMBERS (June 1, 1970 through August 31, 1970): *Honorary*—Mrs. Joseph A. Witt, Joseph A. Witt. *Supporting*—Seattle City Light. *Contributing*—Mrs. Peter D. Jarvis. *Sustaining*—Mrs. Thor C. Tollefson. *Annual*—Mrs. R. F. Andrews, Ralph M. Bremer, Ted Brown, Mrs. Robert Bryarly, Mrs. Newman H. Clark, Mrs. Ove Clausen, Lois E. Davis, Mrs. Howard E. Days, Dr. & Mrs. J. Kenneth Deitchman, Mrs. Harold Fuglvog, Mrs. William Golding, Mrs. P. H. Gourley, Mrs. Ward J. Helms, Mrs. Charles W. Hitzroth, Marger A. Kepner, Mrs. Robert LaBounty, Dr. Helen S. Marshall, Mrs. Arthur McGougan, Mrs. Robert P. Moser, Cecila P. Mullen, Mrs. Brandon Nielsen, Marshall R. Olsen, Barbara Osten, M.D., David B. Parker, Mrs. Sidney B. Peters, Mrs. Gaylord Piltier, Mrs. Louis Rousso, Mrs. Ray Segale, Mrs. Thurie C. Thornton, Mrs. Donald A. Turner, Mrs. Herbert P. Vail, Mrs. J. B. Veilleu, Mrs. George A. Wade, Mr. & Mrs. J. B. Wallace.

We are also grateful to the following members who have increased their dues to: *Life*—Mrs. Frederick Jose Blanchett, Mrs. Ralph M. Smith, *Contributing*—Mr. & Mrs. Andrew Price. *Sustaining*—Mrs. Will Otto Bell, Mrs. Wetherill Collins, Mrs. T. R. Conway.

Some of Our Favorites

Won't You Send Us Yours?

PERNETTYA MUCRONATA

*DOROTHY CROPLEY**

The slender branches of Pernettya mucronata weighted down and gracefully arching with their clusters of plump berries are always a delight. The fact that the berries last an unusually long time through the winter months when color in the garden is most appreciated, is an added bonus. It isn't too uncommon for the berries to stay on the shrubs from September or October through March or April. Although various authorities say that birds like to eat the fruit, over a period of several years which included severe winters, I have only seen a robin eating them once. Perhaps if our urban Seattle garden had other birds than robins and an occasional flicker to feast on them, this wouldn't be so. It does mean that I can plan on using the Pernettya branches in the house instead of going out some day and finding that the birds have beaten me to them. Not only do the berries last a long time outside, but as bouquets they are superb. I have had them last up to three weeks indoors before gradually beginning to shrivel. Indoors the one thing that must be done is to keep adding water to the container, as the branches absorb an enormous amount of water.

Pernettya mucronata belongs to the Ericaceae family and is one of the hardiest of the South American shrubs for our gardens. It is native from southern Chile to the Straits of Magellan and the Falkland Islands. It likes a situation much like heather—sunny, but with ample moisture at the roots and an acid, peaty soil. It is a somewhat stiff appearing 2-3 foot tall evergreen shrub until the branches are laden with berries, when it has a more graceful appearance. The glossy dark green leaves are small and oval, terminating in a sharp point, from which comes the "mucronata" portion of its name. It is prickly enough so that it could be used as an informal low barrier hedge. The slender stems, multiple branches and branchlets along with the small leaves give it a fine-textured appearance. Nodding tiny bell-shaped flowers appear in clusters at the ends of the branchlets in May and are not showy. In the garden it combines well with heather, evergreen azaleas, small-leaved rhododendrons and also with certain of the pines.

The berries may be white, white fading to pink, various shades of pink, lilac, red, crimson and purple or nearly black. Because it is used primarily for the berries it produces, it should be bought in the fall so that the color desired can be chosen. Pernettya's only drawback is that its berries are poisonous, so gardeners with small children may wish to avoid it. Since it is dioecious, in order to have a really good crop of fruit a male shrub should be planted nearby. However, several female plants grouped together will also produce fairly well. It was interesting to read that some of the early plants raised were apparently male shrubs, and it was not known for a time that Pernettya produced its lovely berries.

The first recording of Pernettya mucronata was made by Antoine Joseph Pernetty (1716-1801), who accompanied de Bougainville's expedition to the Straits of Magellan and the Falkland Islands in 1763. He served in the dual capacity of officiating priest and natural historian. Pernetty called the shrub "prickly heath" and it did not receive its present name until after his death. The first seed was sent to the Edinburgh Botanic Garden in 1828 by a botanical collector serving with a British exploration ship.

Pernettya looks particularly well with the winter and early spring blooming heathers, the shades of pink together being very effective. Since the berries last so long outdoors, one must be careful not to plant together any clashing color combinations. Three different colors are growing in my garden—white, and two shades of lavender-pink, one a little deeper color than the other. The lighter lavender-pink

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*Dorothy Cropley (Mrs. Malcolm G.) is a first-time contributor to the BULLETIN. She has served as Finance Chairman for the Unit Council and edited the Unit Council Quarterly.

is my favorite, as I have a heavy glass container whose color complements the berries to perfection, and arrangements always please me and bring admiring comments from visitors. The berries are at their best in late September and early October and look extremely well in bouquets with chrysanthemums, especially the spidery less formal floral types. This is a wonderful combination, as chrysanthemums picked at their prime will last about as long as the berries do. The rayonante mum "Patricia Grace" is my first choice to use with my lavender pernettya.

Pernettya spreads by suckers, but I have never found it invasive. Any small plant appearing where it isn't wanted can easily be severed with a shovel and placed elsewhere. My shrubs have never required treatment for pests or disease, as nothing seems to bother them. Pernettya does not need special fertilizing, as too rich a soil will force it into growing tall and scraggly at the expense of berry production. This will also happen if it is grown in too much shade or it receives too much water during the summer. Even during our most severe winters, only small parts of my plants have been killed, and these were easily pruned out and soon filled in with new growth. All in all Pernettya mucronata is a most satisfactory and satisfying shrub, and one which I wouldn't be without. Now all I have to do is find the proper place for one with glowing ruby red berries I saw last fall!

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ARBORETUM WEATHER

July 1, 1969 – June 30, 1970

	Temperature				Precipitation		Sunshine	
	Max.	Min.	Ave.	(Normal)		(Normal)	% Sun	(Normal for last 4 years)
July	87	47	64.7	(64.9)	0.42"	(0.71)	67	(68)
Aug.	82	40	64.0	(74.1)	0.38"	(1.25)	66	(66)
Sept.	83	40	61.0	(59.9)	5.86"	(1.96)	50	(57)
Oct.	70	31	52.4	(52.4)	1.58"	(3.58)	45	(39)
Nov.	64	31	46.6	(43.9)	3.10"	(6.17)	36	(29)
Dec.	54	30	45.2	(40.8)	7.31"	(6.08)	26	(17)
Jan.	58	24	41.2	(38.3)	8.02"	(6.60)	32	(16)
Feb.	65	30	47.0	(40.8)	1.99"	(4.20)	60	(45)
Mar.	63	29	46.0	(43.8)	3.50"	(3.56)	61	(49)
Apr.	68	34	46.1	(49.2)	3.46"	(2.77)	43	(50)
May	81	34	54.7	(55.5)	1.28"	(1.87)	52	(61)
June	98	40	62.7	(59.8)	0.57"	(1.53)	63	(57.5)

July and August were not especially warm nor was there a really large percentage of sunshine during last summer. The major excess in sunshine came during the period December-March, the figures for January and February being unusually high. Rain was exceptionally heavy in September with an excess of 3.90 inches, fortunately coming after the close of the International Botanical Congress. Temperatures of 96°F. and 98°F. on successive days in early June caused considerable leaf burning on the south or west sides of many evergreen plants, both broad leaved and coniferous.

The Arboretum Answers

J. A. WITT

These questions, representative of those asked of the Arboretum Staff, are a continuation of a column begun in an earlier issue.

Q. *I have a big tree which I think is a deodar cedar in my garden. A few months ago it began to look unhealthy and now all the needles have turned brown and are dropping off.*

A. There is a wide range of causes for the condition you describe, but tell me—did you use one of the lawn fertilizers that also contain a week killer on the grass near this tree? (The answer was yes, the weed killer-fertilizer was used a month or so before the tree began to show difficulties.) I can only guess, but I suspect you damaged and perhaps even killed your tree by using this material. The herbicide dicomba which is used in at least one such product is often used to kill woody plants, and when it is applied in the fertilizer mix around trees it is washed to the root zone where it is picked up by the tree. Remember that a tree's roots often extend well beyond the edge of the crown. We recommend that you don't use this type of product near your trees or shrubs. Once it is picked up by the tree there is little you can do to correct the damage.

As an aside, the same problem can arise when using a soil sterilant for killing all plants in walks or driveways. The sterilant can be washed into the roots of nearby ornamentals or the roots of trees can be growing under the path where they will pick up the chemical.

Q. *I have a redbud tree that has its leaves all eaten by something that chews little circles out of their edge. What can I do?*

A. This sounds as if the leaves were being attacked by the leaf-cutter bee, which also bothers roses. I wouldn't worry too much about your redbud; it may be disfigured but the bee really isn't injuring your plant seriously. It is a useful insect, important for pollinating certain crops and shouldn't be killed.

Q. *(very common in late June and early July) What is the big shrub with the cone shaped clusters of tiny fruits that are bright red? Is it poisonous?*

A. My guess is that the plant is red elderbery, *Sambucus racemosa* var. *arborescens*, a common shrub of damp places in this area. The fruit is not, as nearly as I can determine, poisonous, but it is very bitter and I suspect it of being completely unpalatable.

Q. *(referring to above) Well, can you make wine out of these red elderberries if you can't eat them?*

A. You are now out of my field of expertise, but since one can make wine out of rocks if you add enough other ingredients, I would think you could use them. However, I sincerely doubt if the wine would be very good if you did. The common elderberry wine is made from purple fruited species such as *Sambucus cerulea.*

Q. *Can I pick mushrooms in the Arboretum?*

A. Surely. We won't try to identify them for you, however. You may also pick up any cones that have fallen to the ground, but please don't take *anything* growing on our trees and shrubs without express permission from the Director.

Q. *There is a plant of ivy growing at the base of a big fir in my garden which is now beginning to climb up the trunk. Is it going to kill my tree?*

A. This is going to depend on a number of

factors including the growth rate of the tree and of the ivy.

There are two dangers to the tree. First, the vine may actually girdle it, by growing completely around the trunk. In a rapidly growing tree the stems of the ivy will act just like a wire or rope wrapped about it. In more mature trees, where the growth rate is slow, the danger of this is much reduced. Secondly, if the ivy climbs into the crown of the tree it may actually shade out the foliage enough to do severe injury. This usually takes many years. Generally speaking, it is best not to allow ivy on your trees unless they are very large.

BROWN LEAF FROM A TREE
UNKNOWN CLINGS
TO A STRANGE
GREEN-SPOTTED MUSHROOM
BASHO

SAXE FLORAL

ALL YOUR GARDEN NEEDS

and

CUT FLOWERS

Too

LA. 3-4415 LA. 2-1951

Have you discovered the beauty of the Arboretum Nature Trail? The following letter, received recently by the Director, expresses the appreciation of someone who has!

Gentlemen –

When the trail through the marshes out to Foster island was first opened to the public, we took this new addition to the Arboretum. It was in the fall and the path was developed with so little disturbance of the natural cover that one was impressed with the beauty of the golden color of the water plants, the song of the red winged blackbird with no thought of brash, raw newness.

During this summer we have made several trips, at different time of day (though very early morning is still our favorite) with much pleasure to find a whole new aspect of the area in full bloom! Guests from out of the city are greatly impressed with the beauty it offers, the quiet but varied activity going on for one who is alert . . . . and all within the environs of a large city. As Seattleites of long residence, who at one time loved this area as it was and canoed through the marshland, we gratefully salute the effort which has brought this latest access to many who may now enjoy it! Thank you!

Very sincerely yours,

Mrs. Frederick E. Gleason

Unit Conversations

The UNIT COUNCIL EDUCATION PROGRAM continues to fill member needs and to provide opportunities for additional growth and understanding.

The ARBORETUM EXPLORERS meet each fourth Wednesday of the month at 10 a.m. except in December. This summer they took the Waterfront Trail on one occasion, and in August were fortunate enough to tour the Sorbus collection with Mr. Mulligan, who is a specialist in the genus. Attendance has averaged 10 to 12 persons, and all who wish may join the group on a single outing or as often as they like without previous appointment.

A second RHODODENDRON STUDY GROUP will be formed if there is sufficient demand. Interested persons should leave name and phone number with the Arboretum Foundation Office, EA 5-4510.

The ROCK GARDEN STUDY GROUP will meet at 10 a.m. on the fourth Monday of each month except December. Potential members may call Mrs. Dwight Henderson, LA 5-9379.

The UNIT COUNCIL MEETINGS have scheduled the following slide programs for 1970-71:

September 17 — Mr. Reid Kenady, "Plants in the North Cascades National Park"

November 19 — Mrs. Scott Cassill, "Flora of the Islands of Corsica, Elba, and Sardinia"

February 18 — Mr. Joseph Witt, "Plant Introduction by the University of Washington Arboretum"

May 20 — Mrs. William Speidel, "Love on a Rooftop"

All Unit members are welcome to attend these programs, which begin at 1 p.m. at the Sand Point Community Methodist Church.

THE GUIDE PROGRAM — A PROGRESS REPORT

Approximately every other year training classes are held for people who wish to volunteer as guides for either the Japanese Garden or the Native Plant Walk. In the past this training program has often been limited to members of the Arboretum Foundation. This year an effort has been made to recruit guides from the community at large. The Native Walk training classes held from 10 until 12 on Tuesdays during the month of August resulted in the training of 31 new guides. An interesting cross section of people responded to our invitation to be guides including several men, a public school teacher, students and women from residential areas both near the Arboretum and from as far away as Bremerton.

We were especially fortunate in having outstanding speakers and fascinating subjects for each of our training sessions. Mrs. W. L. Wolfe of Lake Stevens who holds a Master's degree in botany from Cornell University showed slides of and lectured about poisonous plants. Mr. Joe Witt, Assistant Director of the Arboretum, discussed its history, policies and operation. Dr. Erna Gunther, a professor emeritus from the University of Washington and an international authority on Northwest Indians talked about the "Ethnobotany of Western Washington." Mrs. Joe Witt, a noted authority on iris with a Master's degree in taxonomic botany lectured and showed slides depicting the "Life Zones of Washington State." Mrs. Richard Sherry, well-known Northwest conservationist, conducted a marvelous guided tour of the Native Walk. Miss Sharon Collman, a doctoral candidate in entomology at the University of Washington took the group to the Arboretum pond for a discussion of the aquatic plant and animal life. Finally our own experienced guides, Lucille Phillips and Dora Murphy conducted a "typical" tour of the walk for all the new guides.

As it is always so easy for us to go along looking without really seeing, the guides have

provided a real service to the children and others who have been helped to see the great variety and beauty of the native plants of Western Washington. ▲

Book Reviews

THE ETERNAL QUEST; THE STORY OF THE GREAT NATURALISTS by Alexander B. Adams, Putnam, New York, 1969. $10.95

Here is an I-dare-you-to-put-it-down-before-you-finish account of the lives and ideas of the great naturalists and scientific thinkers of the world. It encompasses thought and discoveries from the time of Thales of Miletus, born 640 B.C., to Darwin and the 19th century. More than one hundred scientists are included.

Among these amazing men are: Anixamander, born 610 B.C., who made reliable maps of the known world of his time; Aristotle, born 348 B.C., who tutored Alexander the Great, and was considered by Darwin to be one of the greatest biologists of all times; Crateuas, born c. 111 B.C., a pharmacologist interested in medicinal herbs who wrote an illustrated book on Botany; Dioscorides, c. 1 A.D., author of an Herbal accepted as an authority for many centuries; Al Kindi, born 810 A.D., in Baghdad, who wrote on such subjects as meteorology, optics, tides, and reflections of light; Al Khowarizmi, c. 830 A.D., who was the first mathematician to use the word "Algebra" in its modern sense—and who also first used the numerals we call Arabic, which he adopted from the Hindu.

One of the amazing things about scientific thought is the spontaneous revelation of new theories by more than one man. The world-shaking ideas of Darwin's *Origin of Species* were simultaneously formulated by Alfred Wallace, an English collector of botanical and animal specimens in the orient. Wallace sent his paper to Darwin, who was so scrupulous and ehtical that he felt that Wallace's name should be included as a joint author on his *Origin of Species.*

The apendices include an excellent selected bibliography, and a valuable 17-page biographical supplement with alphabetical thumb-nail sketches of the book's "cast of characters." Appendix B consists of an enlightening review of Classification and Taxonomy—of particular interest with the life of Linnaeus. Appendix C is a geologic table, and Appendix D is a summary of Mendel's discoveries.

Much of the fascination of the book stems from its delightful style which shows the continuity and interrelationship of intellectual exploration and discovery in a story-like narrative which is completely factual, but has an almost magic appeal as the scope and enlarged comprehension of all mankind are depicted.

MRS. BERNICE F. SMITH

INTRODUCED TREES OF CENTRAL CALIFORNIA by Woodbridge Metcalf, University of California Press, Berkeley and Los Angeles, 1968. $2.25

This fine book, offered in handbook form, is a welcome addition to any shelf or wandering pocket. The author, in 159 pages, has designed the book to aid in the identification of many trees which have been brought to California. These trees, with others, have found their way to being planted in coastal, valley and foothill areas of central California.

For the curious layman the book is a beautifully presented collection of these trees, many of which were introduced as ornamentals but which have gone on to exceed some native species in growth and development.

The coniferous trees are well covered. However, of special delight to the reviewer was the treatment given to evergreen and deciduous broadleaf trees.

Trained foresters will themselves find pleasure in these brief glimpses at old friends whose appearance, common, or scientific names might have slipped from mind.

There are eight pages of handsome color illustrations of selected conifers and broadleaf trees. Brief description of site conditions are given with many species which should spark the visitor or traveller to be on the lookout for some trees for use in certain known locations.

Also included in the book are notes on how the trees were utilized and their economic importance.

In the introduction the author lists many specific areas where collections of fine exotic trees exist. He points out that probably over 300 trees were introduced but that only about 200 are considered in the handbook.

Reading through this book will be an exercise in meeting many old friends.

JAMES P. JOHNSTON

THE COLOR DICTIONARY OF FLOWERS AND PLANTS FOR HOME AND GARDEN by Roy Hay and Patrick M. Synge. American Consultant, George Kalmbacher, Taxonomist, Brooklyn Botanic Garden. Published in collaboration with the Royal Horticultural Society—Crown Publishers, Inc., New York. $15.00.

Mr. Hay, popular British broadcaster and columnist on gardening subjects, and Mr. Synge, Editor-in-Chief for the R.H.S., have collaborated on this very desirable and beautifully illustrated book. There are 2048 colored photographs, preceded by cultural notes. Following is the dictionary in botanical name order with full cross-references of common names. Categories include bulbs, trees and shrubs, herbaceous perennials, annuals and biennials, greenhouse and indoor plants and rock garden plants. In addition, there are some notes on photographing plants by Harold D. J. Cole, past President of the Royal Photographic Society of Great Britain.

MARJORIE W. BAIRD

IN PURSUIT OF THE MOUS, THE SNAILE, AND THE CLAM; A ROVING DICTIONARY OF THE ANIMAL KINGDOM. Mary Durant. Illus. by Victoria Chess. Meredith Press, New York, 1968.

This charming book explains whimsically the derivation of over 300 common "English" names of birds, beasts, fish and insects. It commences with *Aardvark*, literally *earth pig*, which comes from the Dutch settlers' language in South Africa, and ends with *Whale*, for which exact derivation is unknown, possibly literally "the roller," possibly Latin *Balaena*, a whale, or from *squalus*, Latin for any large sea fish. These descriptive and strange words stem from Sanskrit, Greek, Latin, French, Spanish, German, Portuguese, American Indian or other.

Each definition is accompanied by a well-chosen and suitable quotation from an author who used the name in his writing, including Heroditus, Ben Johnson, Shakespeare, Marco Polo, Pliny the Elder, Izaak Walton, Robert Burns, etc., etc., etc. One example is from the writings of William Caxton in 1489, where he speaks of mastiffs "Mastyuys and bytynge dogges in lytell houses." The origin is from the Latin verb *mansuescere*, to tame or domesticate. *Mongrel* comes from the Anglo-Saxon word *mang*, a mixture. *Moose* is an American Indian word, *mus*, from the Passamaquoddy meaning "he strips, eats off." *Rhinoceros* comes from two Greek words: rhinos, the nose, and *keras*, a horn.

One of the most informative definitions is that of the Dodo, from the Portuguese *doudo*, silly or stupid. These birds were found on the Island of Maruitus in 1505, but have been extinct since 1681. In 1598 Admiral Jaacob van Neck of the Dutch navy brought a dodo to the royal zoo at Het Loo, and in the same year a second dodo was brought to Europe for the menagerie of Rudolph II of Hapsburg. Both birds enjoyed captivity, and were favorite subjects of Dutch and German artists, from whose work we know what a real dodo really looked like.

The black and white illustrations by Victoria Chess are delightfully suitable. This is a book for the relaxed scientist, or for any layman who likes animals, nature, and/or words.

BERNICE F. SMITH
Forest Resources Librarian
University of Washington

HARDINESS *(Continued from page 7)*

Information about a few plants that have been tried in the Arboretum may be useful and is included here for that reason. It should not be assumed however, that the same performance would pertain to other areas for there are certainly some that are more favored and others that are less so.

Abutilon vitifolium—Tall shrub from Chile, needs protection of a wall and perfect drainage. Requires ample water in summer, barest minimum in winter. Planted in 1967, flowered in '68, winter killed in '69.

Acacia retinodes—Small tree from southern Australia. It is fragrant, flowers young and grows rapidly. Can be grown successfully in containers. Give it sandy loam, no peat, and a south wall in full sun. Planted in '59, it reached 14 ft. with a 4 inch trunk before it was killed in Jan. '62. *A. dealbata* is more tender but often comes from the roots after being cut to the ground. *A. pycnantha*, planted in '61, killed by 13° freeze in '62. *A. verticillata*, planted in '57, killed in winter of '68.

Albizzia Julibrissin rosea—Deciduous tree from China. The arboretum is growing a hardy form selected by the Arnold Arboretum. They were planted in '49 and are now splendid trees.

Arctostaphylos—Handsome evergreen shrubs, mostly from California. Need light, well drained soil in full sun, require no watering. Difficult to transplant. Both *A. Manzanita* and *A. Stanfordiana* do well in the arboretum. *A. Hookeri* and *A. densiflora* 'James West' were killed in '68

Ceanothus—Sun loving shrubs mostly from California. Give them light, well drained soil and don't over-water in summer. Difficult to transplant. *C.* 'Puget Blue', planted in '50 was lost in '55; cutting from the original plant grew to great size, survived the winter of '68 but succumbed to a fungus disease. *C. burtonensis*, planted in '56, was lost in '68. *C.* 'Blue Cushion', an exquisite little shrublet, planted in '56, lost in '58 but now having another try. *C. gloriosus exaltatus*, planted in '56, lost in '64. *C. griseus horizontalis*, planted in '56, lost in '59. *C. papillosus*, planted in '52, lost in '68.

Carpenteria californica—Bushy shrub from California. Wants deep, light soil, in a warm position. Three planted in '52, one killed in '55, the remaining two are growing well, although damaged in 1968-'69 winter.

Cornus capitata—Evergreen tree from Himalayas. Requires a deep, rich, well drained soil and protected spot. Planted in '50, it was cut to the ground in '55, shoots came from the roots and were killed in '68. Planted in Aberdeen in '61, it was severely damaged in '64 and again in '68, although it is still living. It has never flowered.

Correa Backhousiana—Downy grey shrub from Australia. Try a light well drained soil, dry sunny location and a lot of protection. Planted in '62, lost in '64.

Crinodendron—Evergreen trees from Chile. Good garden loam suits them well; light shade is usually recommended. *C. Patagua*, planted in '67, flowered in '67 and died in '68. *C. Hookerianum*, planted in '58, was killed in '64. In Aberdeen, it was planted against a south wall in full sun in '60. It has now reached 18 ft.

Inflorescneces of **Albizzia Julibrissin** var. **rosea** — *Photo by B.O. Mulligan*

and flowers wonderfully. It was damaged in '64 and again in '68.

Dendromecon Harfordii—Evergreen shrub with glaucous foliage. Plant against a south wall in well drained light loam with a little mortar rubble. Planted in '57, it grew rapidly and flowered in '58, then died gradually in '62.

Embothrium coccineum—Evergreen tree from Chile. Needs peaty soil in full sun. Planted in '52, it has grown well and flowers beautifully.

Eucalyptus—Tall evergreen trees, most are from Australia. These need rich loam with good drainage and lots of room. *E. coccifera*, planted in '59, was killed in '64. *E. Gunnii*, planted in '49, killed in '61, planted again in '51, killed in '55. *E. niphophila*, three plants set out in '61, one located to the north had grown most vigorously, flowered in '68 and was only slightly damaged in the winter of '68, the one to the south has not grown so well, has not flowered and was badly damaged in '68. *E. parvifolia*, planted in '48, cut to the ground in '55 and again in '68 but is growing again. *E. perriniana*, 5 planted in '57, of which only one remains. It flowered in June of '68.

Eucryphia—Trees or shrubs from Chile. *E. glutinosa*, a semi-deciduous shrub, does well here. *E.* 'Nymansensis', planted in '49, killed in '55. Planted again in '62, still living but doesn't flower. Grows well in Aberdeen, only slightly damaged in '68 but no flowers. *E.* 'Intermedia', is growing well but has not flowered except for one which flowered in '69 and died thereafter.

Eugenia Chequer—Evergreen tree, quite tender, for favored situations. Grows well in any good garden loam in sun. Planted in '55, flowered in '61 and cut to the ground in '68.

Fremontia californica var. viridis (Fremontodendron)—Semi-evergreen shrub. Plant in sandy loam against a sunny wall, transplants very poorly. Planted in '65, came through the winter of '68 with the protection of a burlap cage. Very handsome and well worth a try.

Hoheria glabrata—Deciduous shrub or small tree from New Zealand. Planted in '57 and in '59, grew well and flowered in spring of '68. None survived the winter of '68. An earlier planting in '52 flowered in '54 and was killed in Nov., 1955.

Lagerstroemia indica—Deciduous tree from China. Planted in '58, still living but flowers very poorly, except in warm summers. Crepe myrtle tree.

Magnolia Campbellii—Splendid deciduous tree from Sikkim. Needs deep rich soil and good drainage. Said to flower in 20 to 30 yrs. The arboretum plant was set out in '58 and flowered in '67, only 9 yrs. later. An outstanding success so far.

Myrtus communis v. tarentina—Small evergreen shrub; needs hot dry position and good drainage. Planted in '65, flowered in '66 and still with us.

Viburnum odoratissimum—Evergreen shrub with exceptionally beautiful foliage. Needs rich, moist soil in sun or light shade. Planted in '58, damaged in '64 and again in '68 but growing well. Flowers poorly but worth growing for the foliage alone. ▲

ARBORETUM REPORT *(Continued from page 23)*

Resources faculty, a series of nine Plant Clinics were held from January 15 through May 21. The public was invited to bring plant disease or pest problems to these clinics for consultation and diagnosis. The response was not especially heavy at first but later sessions were better attended. The Director and Assistant Director were active in advising various public agencies such as the State Highway Department, City of Seattle, Yakima Area Arboretum, and the Arboretum Committee of Western Washington State College.

A new detailed map of the Arboretum was reprinted from the Fall issue of the *Arboretum Bulletin*; a somewhat more generalized map and information folder published for the International Botanical Congress in August 1969, and a more elaborate fully illustrated 36-page brochure entitled *The University of Washington Arboretum—A Nature Showcase for all Seasons*, was developed for the same event.

(b) **Educational**

As in past years the demand for speakers from the Arboretum staff was high. Some 28 lectures and demonstrations, as well as twenty tours of the Arboretum, were given during this year.

Short Courses offered during this period included six "Arboretum in Depth" tours by Mr. Witt; two pruning classes taught by Mr. E. Narro; classes in "Summer Cuttings" and "Winter Propagation" by Mr. van Klaveren; and autumn and spring classes in "Nature Photography" by Mr. D. F. Riecks, Director of Audio-Visual Services at the University.

(c) **Exhibits and Shows**

An exhibit of unusual maple species including photographs and living plants was staged for the annual meeting of the International Shade Tree Conference in Portland in August. In late March an exhibit of Plant Introductions by the Arboretum was set up for the Washington State Nurserymen's Association in conjunction with National Lawn and Garden Week. As usual the Arboretum had displays at the Seattle Rhododendron Society shows in April and again in May.

Cut material from plants native to the State is given regularly to the Seattle Science Center for their display on "The Life Zones of Washington."

(d) **Meetings Attended**

The Director and Assistant Director attended the annual meeting of the International Shade Tree Conference in Portland, Oregon, in August, and the American Horticultural Society's annual meeting in Philadelphia in September, at which time the Director also attended the annual meeting of the American Association of Botanic Gardens and Arboreta at Wilmington, Del.

In February both went to Vancouver, B.C. for the Northwest regional meeting of the International Shade Tree Conference where Mr. Witt gave a paper on "Some Unusual and Promising New Shade Trees." The Director attended the Board of Directors' meeting of the American Horticultural Society in Washington, D.C., March 13 and 14, and the Botanical and Horticultural Librarians' Conference at the Hunt Botanical Library, Pittsburgh, Pa., April 24-25, after delivering an address on "Maples" to the Clara B. Ford Garden Forum at Dearborn, Mich. the preceding day.

(e) **XI International Botanical Congress**

During the eight days of the Congress the Arboretum staff conducted two and sometimes three tours each day except for the Congress holiday of August 30th. Some 500 botanists availed themselves of this service while many others came on their own. The Assistant Director organized and helped conduct a week-long, post-Congress tour to Mt. Rainier and the north Cascades.

7. **Miscellaneous**

Two new wood benches with concrete footings were constructed by the Physical Plant Department of the University and set up at the north end of Foster's Island. These are

memorials to the late Otto E. Holmdahl, landscape architect, and were funded by a bequest from him to the Arboretum. Another bench has been placed in memory of Daniel J. Marston on the hill west of and overlooking Azalea Way. This was given by Mrs. Marston and friends of the family.

The new lighting system along Lake Washington Blvd. was completed during May, by a cooperative effort of funding and installation between the City Engineering Department, the University and the Park Department. The fixtures were designed by Eric Hoyte, landscape architect for the University.

Two new picnic tables were built for us by the University's Physical Plant Department, using funds from Units 19, 32, and 47. They have been placed on the west side of E. Foster's Island Road near the lagoon and in the shade of trees.

A graduate landscape architect student from the University of Oregon, Henry Maekawa, has utilized the Arboretum records to write a thesis on the planning and development of an Arboretum, sending out a comprehensive questionnaire to other arboreta and botanical gardens to obtain more information on the subject.

Work on the catalogue of our woody plant collections is proceeding satisfactorily; the existing cards are now being typed into an alphabetical list, and when this is completed we can proceed to the details of publication.

Visitors to the Japanese Garden

1969; 35,950 1968; 36,822 1967; 36,061
1970; January through June, 31,876

Traffic count outside offices

1969; 149,725 1968; 156,148 1967; 157, 762
1970; January through June, 93,758*

*Accuracy may be questionable because of mechanical problems of counter in May and June.

8. **Weather** (July 1969-May 31, 1970)

The summer months of 1969 were not unusual in any way; temperatures were near normal and so was rainfall. The percent of sunshine also was about average for that period. September was unusually wet with 5.86 inches of rain, an excess of 3.90 inches; otherwise the fall months were about average in temperature and sunshine recorded.

December, January, February and March were all much warmer than usual, February being 6.2°F. over the average. They also had much more sun than in the previous four years (in January twice as much as the average, in February, 25% more) while rainfall was about normal for the four month period, although February was considerably drier than usual.

The flowering season was exceptionally early—at one time we estimated it to be nearly a month ahead of normal—and was particularly heavy among the rhododendrons. Most other genera, except for the Asiatic magnolias, were above average in performance, e.g. *Cornus Nuttallii*, the crab apples, mock oranges, and azaleas. In fact, we consider this to have been one of the best seasons for quantity of bloom on a very wide range of plants that we have so far experienced here, continuing right up to midsummer.

Then, when the maples have burst
out into color, showing like great bonfires
along the hills, there is indeed a feast
for the eye.

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THE ARBORETUM FOUNDATION
STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS BY FUNDS
YEAR ENDED APRIL 30, 1970 *

	Consolidated
Receipts:	
Dues	$ 21,535.00
Donations	5,587.47
Unit Council—	
Plant sales	10,227.06
Other	1,262.73
Interest on savings accounts	5,585.62
Net income from Investment Trust	775.61
Advertising and miscellaneous	563.15
Discount earned on matured short-term investments	3,430.10
	48,966.74
Disbursements:	
Salaries and Christmas bonus	14,001.70
Payroll taxes	590.24
Membership expense	1,739.75
Bulletin publication	4,224.50
Publicity and educational program	1,223.64
Telephone	311.87
Professional services	1,165.00
Other Council expenses—	
Plant sale costs and expenses	4,612.57
Utilities, supplies, postage and books	623.66
Working Fund advance	500.00
Miscellaneous	749.11
Donations to University of Washington Arboretum, including $3,000.00 by Unit Council	8,781.75
	39,038.17
Excess of receipts over disbursements for the year before interfund transfers and purchases of investments	9,928.57
Cash balances, April 30, 1969	180,645.20
	190,573.77
Transfers (to) from General Fund	—
Purchases of short-term investments, net of cost ($176,569.90) recovered on securities purchased and matured during the year	(93,105.19)
Cash balances, April 30, 1970	97,468.58
Allocation of cash held in General Fund for account of other funds	—
Allocated cash balance, April 30, 1970	$ 97,468.58
Endowment Trust Fund Principal	15,388.43
General and Floral Hall Funds	
General Fund	14,431.08
Floral Hall Fund	78,674.11
	93,105.19
United States Government Obligations	93,105.19
Allocated Cash Balance	97,468.58
Funds on Hand April 30, 1970	$190,573.77

*Financial Statement as prepared by Price Waterhouse & Co.

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